

REMARKS

Claims 1-9 and 13-21 are pending in the present Application.

I. The obviousness rejections of claims 1, 8, 10, and 11 based on Conley (US 2004/0203254), as noted on page 2 of the Office Action.

The USPTO respectfully rejects claims 1, 8, 10, and 11 under 35 U.S.C. § 103(a) as being anticipated by Conley. Claim 1 is an independent claim, and claim 8 has been amended to depend from independent claim 1. Claims 10 and 11 are cancelled.

A. Conley does not teach or suggest that the removing impurities comprises removing residual carbon, as claimed in claim 1.

Claim 1 claims in relevant part:

“wherein the removing impurities comprises **removing residual carbon.**”
(emphasis added)

No new matter is added by the amendments. Support for the amendments can be found on page 6, lines 14-21 and page 7, lines 6-17 of the present specification. Regarding these limitations, it is respectfully not seen where Conley teaches the claimed method quoted above.

For example, the USPTO respectfully argues on page 2 of the Office Action that paragraph [0052] of Conley teaches the specifically claimed removing impurities of claim 1. However, regarding the amendment, it is respectfully important to note that Conley teaches a method involving an **inorganic** reaction, i.e., a reaction between $\text{Hf}(\text{NO}_3)_4$ and HfCl_4 (see paragraphs [0038], [0041] of Conley). In other words, it is respectfully important to note that **there is no carbon in the method taught by Conley. Thus, it is respectfully not possible for Conley to teach or suggest that the removing impurities comprises removing residual carbon,** as claimed in claim 1.

Additionally, even if a new prior art search is performed by the USPTO, it would not make technical sense to modify the primary reference Conley to include a step of removing residual carbon. For example, as noted above, the method taught in Conley involves an inorganic reaction that involves no carbon. In order to include a step of removing residual carbon, as claimed in claim 1, **the precursors in Conley would have to be completely changed**

and the reaction would have to be completely changed from an inorganic reaction to an organic reaction. In other words, **modifying Conley to include a step of removing residual carbon would require a complete redesign of the method in Conley and would change the principle of operation of the method in Conley, and therefore such a modification of the primary reference Conley would not be obvious** (see MPEP 2143.01)

In contrast, pages 5-7 of the present specification illustrate at least one possible embodiment of the claimed method quoted above. For example, page 5, line 25 through page 6, line 2 of the present specification describes that impurities are removed from a deposited film. As described on page 6, lines 14-21 and page 7, lines 6-17 of the present specification, **these desorbed impurities may include gases such as C₂H₄, CH₄, C₂H₆, and CO₂** (see also pages 12-13 of the present specification). In other words, the removing impurities comprises removing residual carbon, as claimed in claim 1.

The distinction noted above is important and non-trivial because its results in significant advantages over conventional methods. For example, as explained on pages 13-14 of the present specification, **removing residual carbon results in more desirable electrical properties in the finished device.**

Thus, it is respectfully asserted that Conley does not teach or suggest all of the limitations of independent claim 1. Therefore, it is respectfully asserted that independent claim 1 is allowable.

B. The dependent claims.

As noted above, it is respectfully asserted that independent claim 1 is allowable, and therefore it is further respectfully asserted that dependent claim 8 is also allowable.

II. The obviousness rejections of claims 2-7 and 9 based on Conley in view of Colombo (US 2005/0136690), as noted on page 3 of the Office Action.

The USPTO respectfully rejects claims 2-7 and 9 under 35 U.S.C. § 103(a) as being unpatentable over Conley in view of Colombo. Claim 9 is an independent claim.

A. The cited references do not teach or suggest that the removing impurities comprises removing residual carbon, as claimed in independent claim 9.

Claim 9 claims in relevant part:

“wherein the removing impurities comprises **removing residual carbon.**”
(emphasis added)

No new matter is added by the amendments. Support for the amendments can be found on page 6, lines 14-21 and page 7, lines 6-17 of the present specification. Regarding these limitations, it is respectfully not seen where Conley teaches the claimed method quoted above.

For example, the USPTO respectfully argues on page 3 of the Office Action that paragraph [0052] of Conley teaches the specifically claimed removing impurities of claim 9. However, regarding the amendment, it is respectfully important to note that Conley teaches a method involving an **inorganic** reaction, i.e., a reaction between $\text{Hf}(\text{NO}_3)_4$ and HfCl_4 (see paragraphs [0038], [0041] of Conley). In other words, it is respectfully important to note that **there is no carbon in the method taught by Conley. Thus, it is respectfully not possible for Conley to teach or suggest that the removing impurities comprises removing residual carbon,** as claimed in claim 9.

Additionally, the Colombo reference respectfully cannot overcome these deficiencies in the primary reference Conley. For example, as noted above, the method taught in Conley involves an inorganic reaction that involves no carbon. In order to include a step of removing residual carbon, as claimed in claim 9 **the precursors in Conley would have to be completely changed and the reaction would have to be completely changed from an inorganic reaction to an organic reaction.** In other words, **modifying Conley with Colombo to include a step of removing residual carbon would require a complete redesign of the method in Conley and would change the principle of operation of the method in Conley, and therefore such a modification of the primary reference Conley would not be obvious** (see MPEP 2143.01).

In contrast, pages 5-7 of the present specification illustrate at least one possible embodiment of the claimed method quoted above. For example, page 5, line 25 through page 6, line 2 of the present specification describes that impurities are removed from a deposited film. As described on page 6, lines 14-21 and page 7, lines 6-17 of the present specification, **these desorbed impurities may include gases such as C_2H_4 , CH_4 , C_2H_6 , and CO_2** (see also pages 12-13 of the present specification). In other words, the removing impurities comprises removing residual carbon, as claimed in claim 9.

The distinction noted above is important and non-trivial because its results in significant advantages over conventional methods. For example, as explained on pages 13-14 of the present

specification, **removing residual carbon results in more desirable electrical properties in the finished device.**

Thus, it is respectfully asserted that the cited references, taken either alone or in combination, do not teach or suggest all of the limitation of independent claim 9. Therefore, it is respectfully asserted that independent claim 9 is allowable over the cited references.

B. The dependent claims.

As noted above, it is respectfully asserted that independent claim 1 is allowable, and it is further respectfully asserted that Colombo does not overcome the deficiencies in Conley noted regarding independent claim 1. Therefore it is further respectfully asserted that dependent claims 2-7 are also allowable.

III. The new claims.

Applicants respectfully note that new claims 13-21 have been added. No new matter is added by the amendments. Support for the amendments is found on pages 5-7 of the present specification

IV. Conclusion.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable. Accordingly, reconsideration and allowance of all of the claims is respectfully requested.

Please contact the undersigned for any reason. Applicants seek to cooperate with the Examiner, including via telephone if convenient for the Examiner.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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